Section VI: Technical Perspective of the NESDIS Cloud Framework

NESDIS Cloud Summit

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9. Looking Toward a NESDIS Cloud Future
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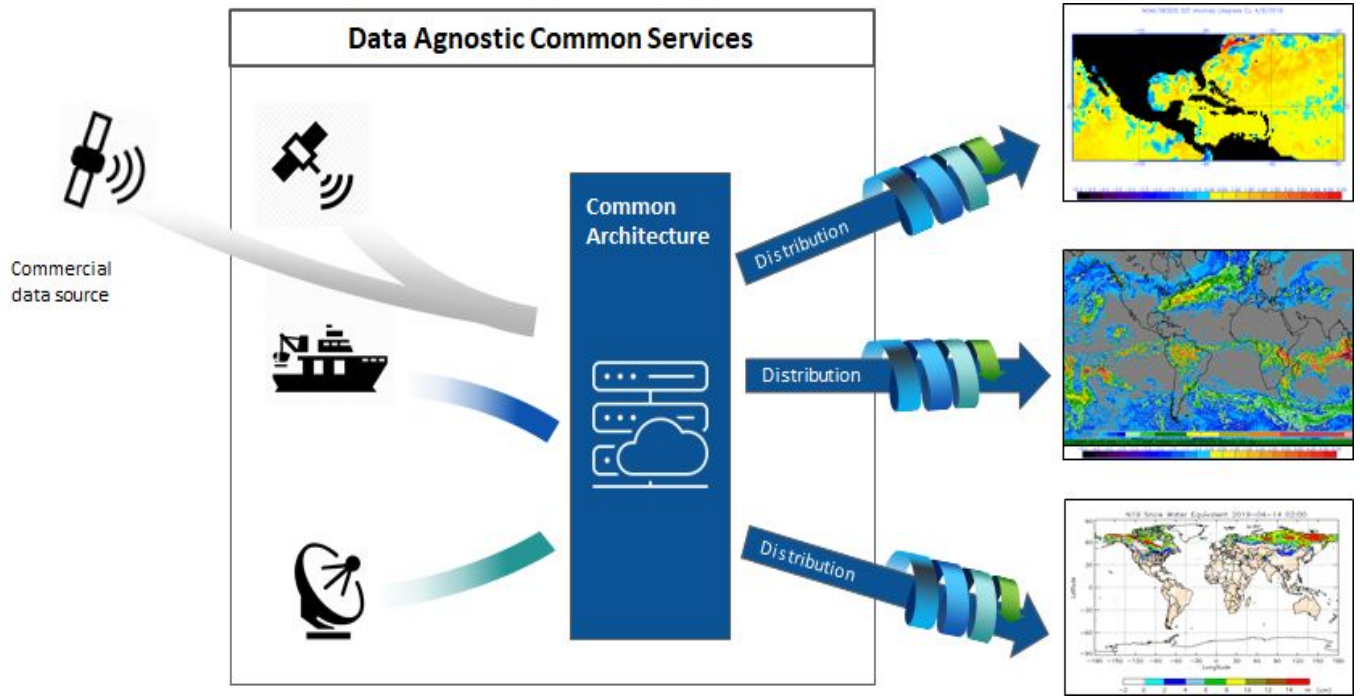
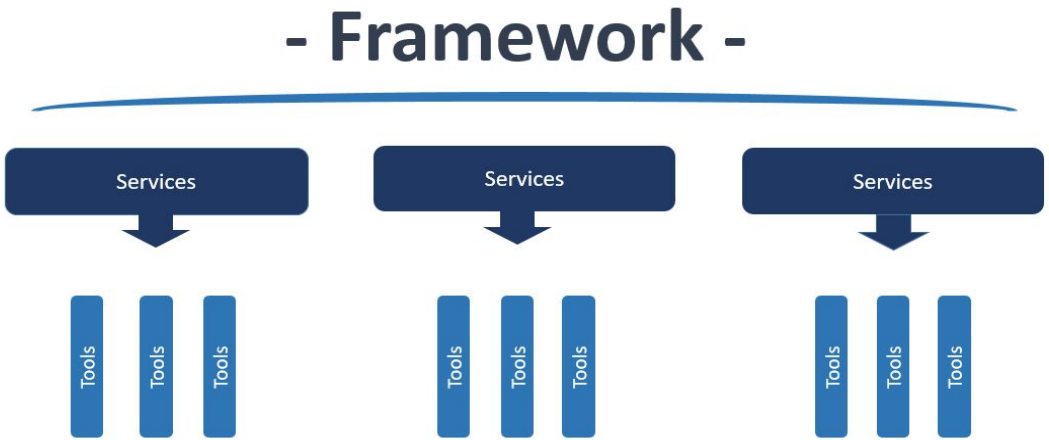
Motivation

Implement cloud-enabled end-to-end ground service capabilities that are secure, scalable, lifecycle cost effective, and data source agnostic

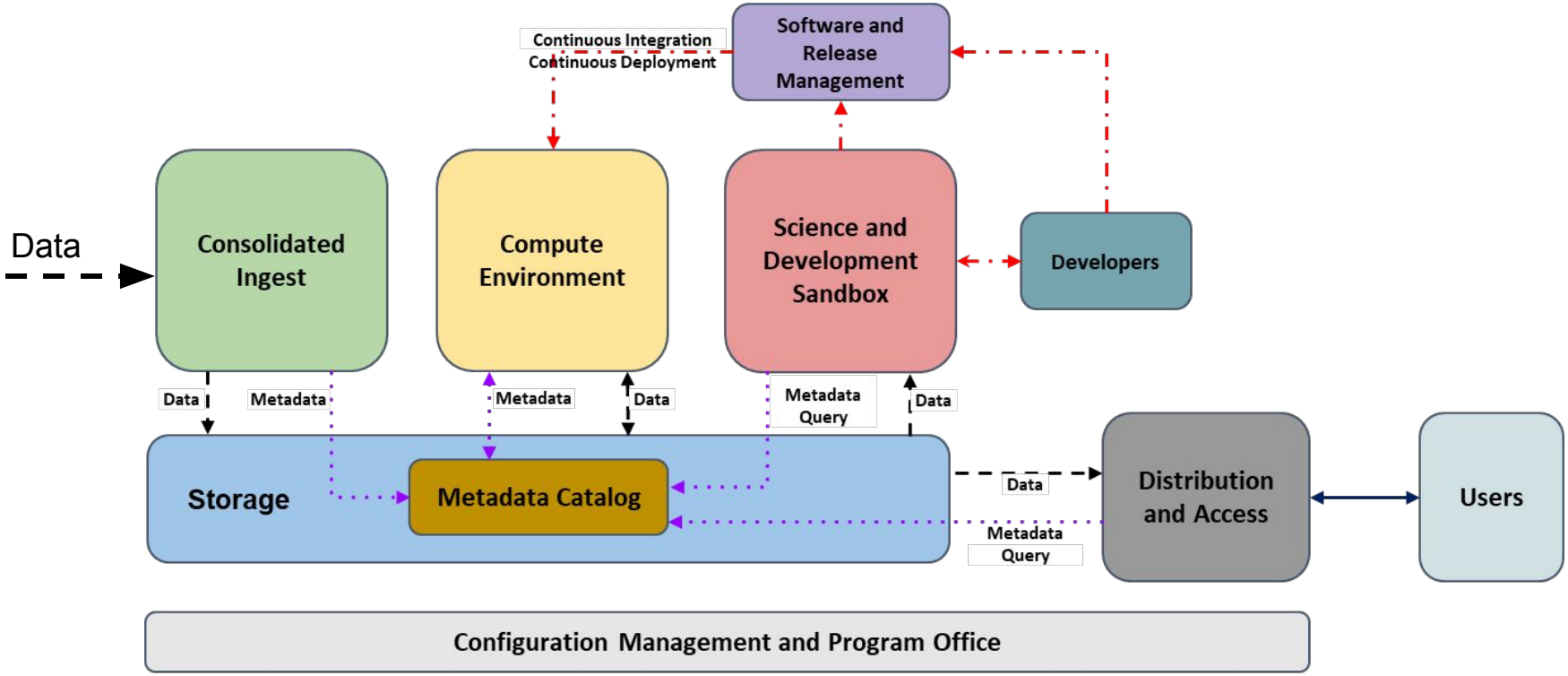


NESDIS Cloud Framework Lexicon

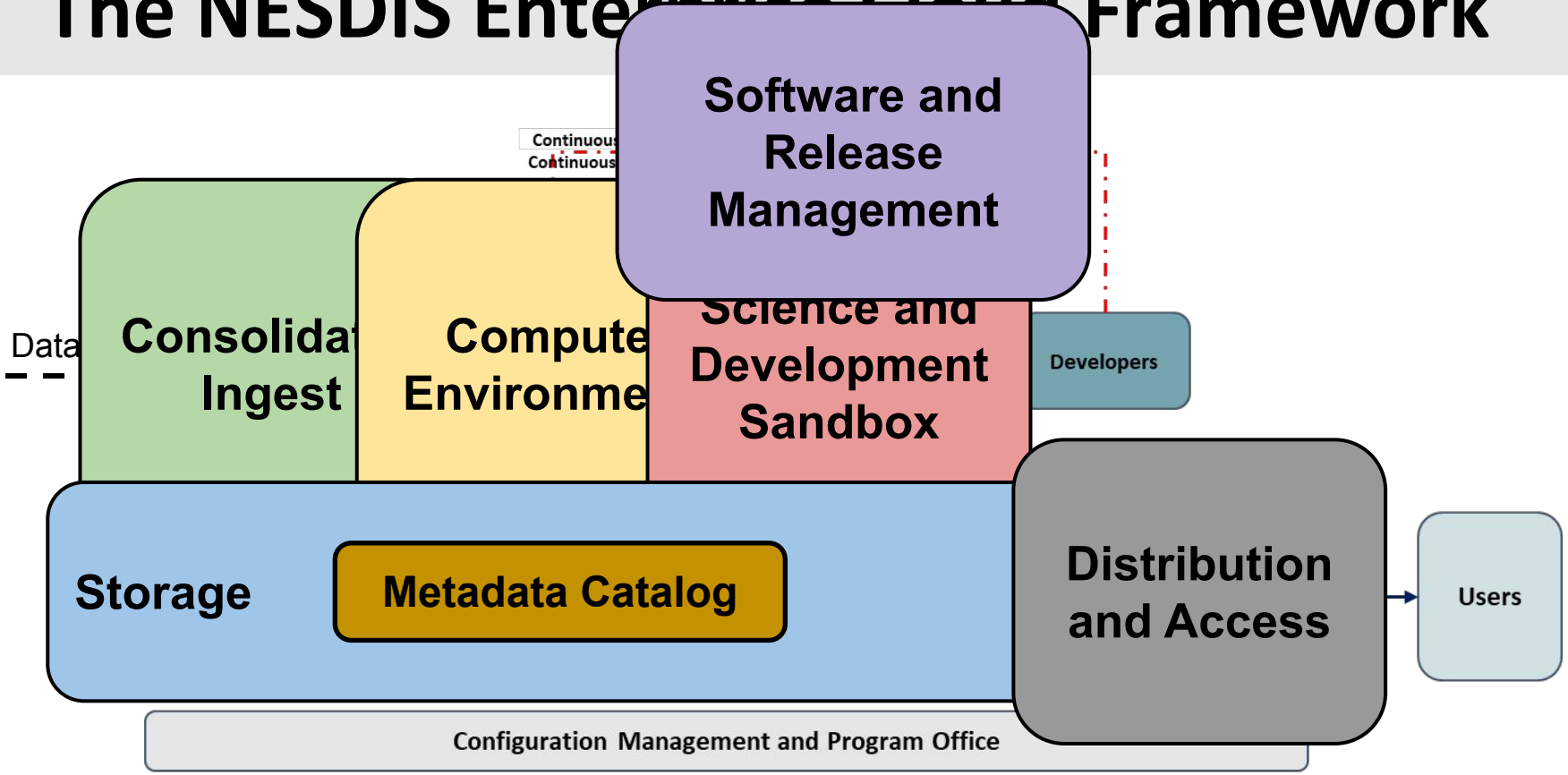
- **Framework** : enables a set of services to work together to deliver the mission value
- **Service** : how to meet the core NESDIS IT functions
- **Tool** : cloud software application(s) used to implement the service



What Do We Mean by “Framework”?



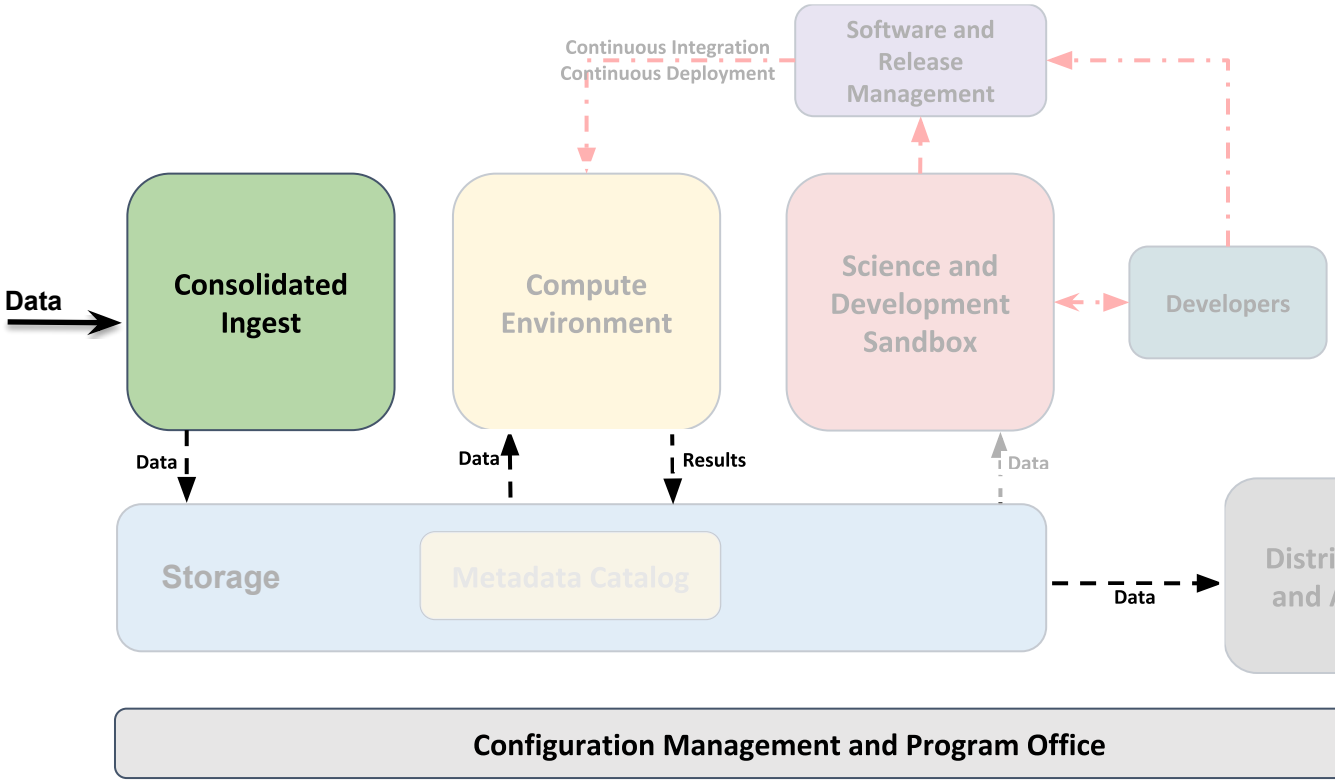
The NESDIS Enterprise Cloud Framework



Benefits of the NESDIS Cloud Framework Architecture

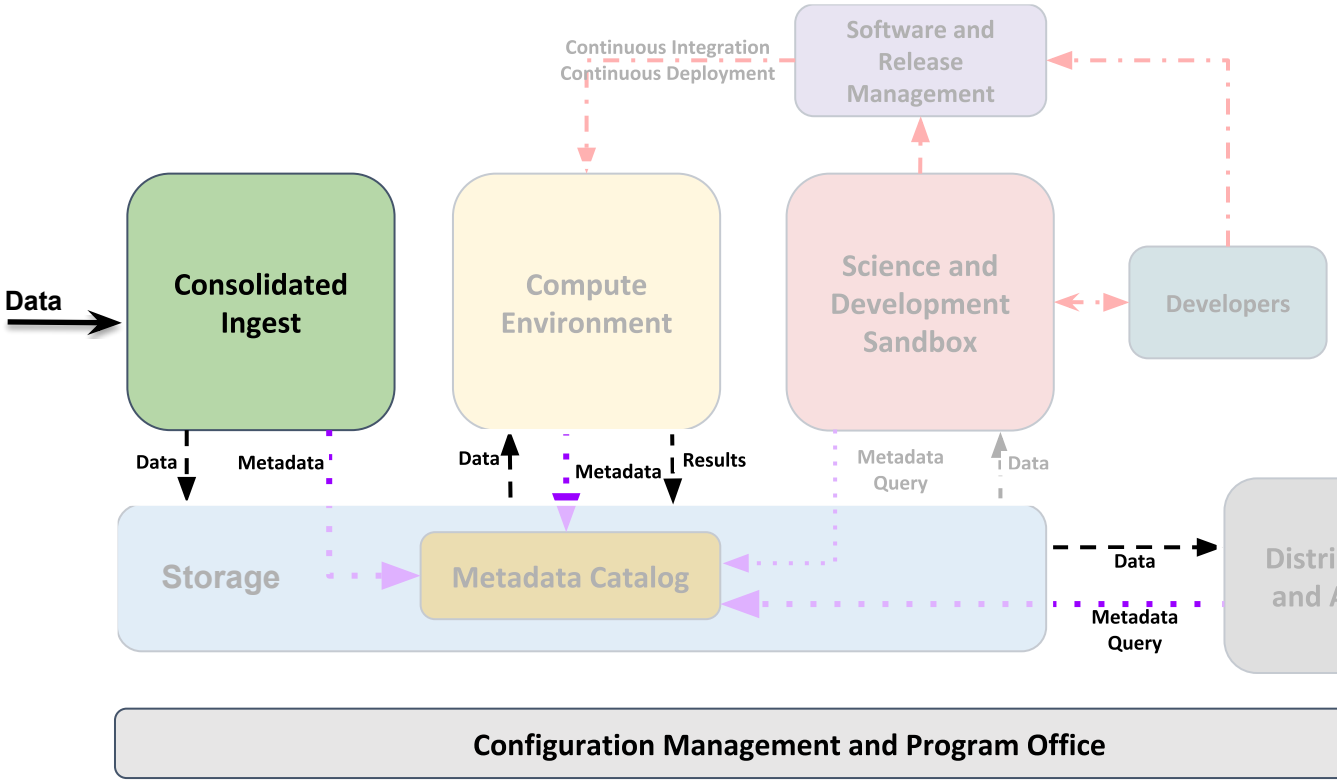
- **Secure** – FISMA compliant FedRAMP Moderate cloud services
- **Fault-Tolerant** – redundant and highly available services lead to robust, fault-tolerant applications
- **Scalable** – capacity to accommodate all current and future workloads
- **Data Agnostic** – enable any data type and workflow within the framework
- **Decoupled** – services are independent of each other and are interchangeable
- **Cloud Agnostic** – workloads and services run in any cloud service provider
- **Resources On-Demand** – rapid provisioning of cloud framework services based on business needs
- **Agile** – support agile processes with DevOps

Cloud Framework Use Case: Secure Ingest Workflow



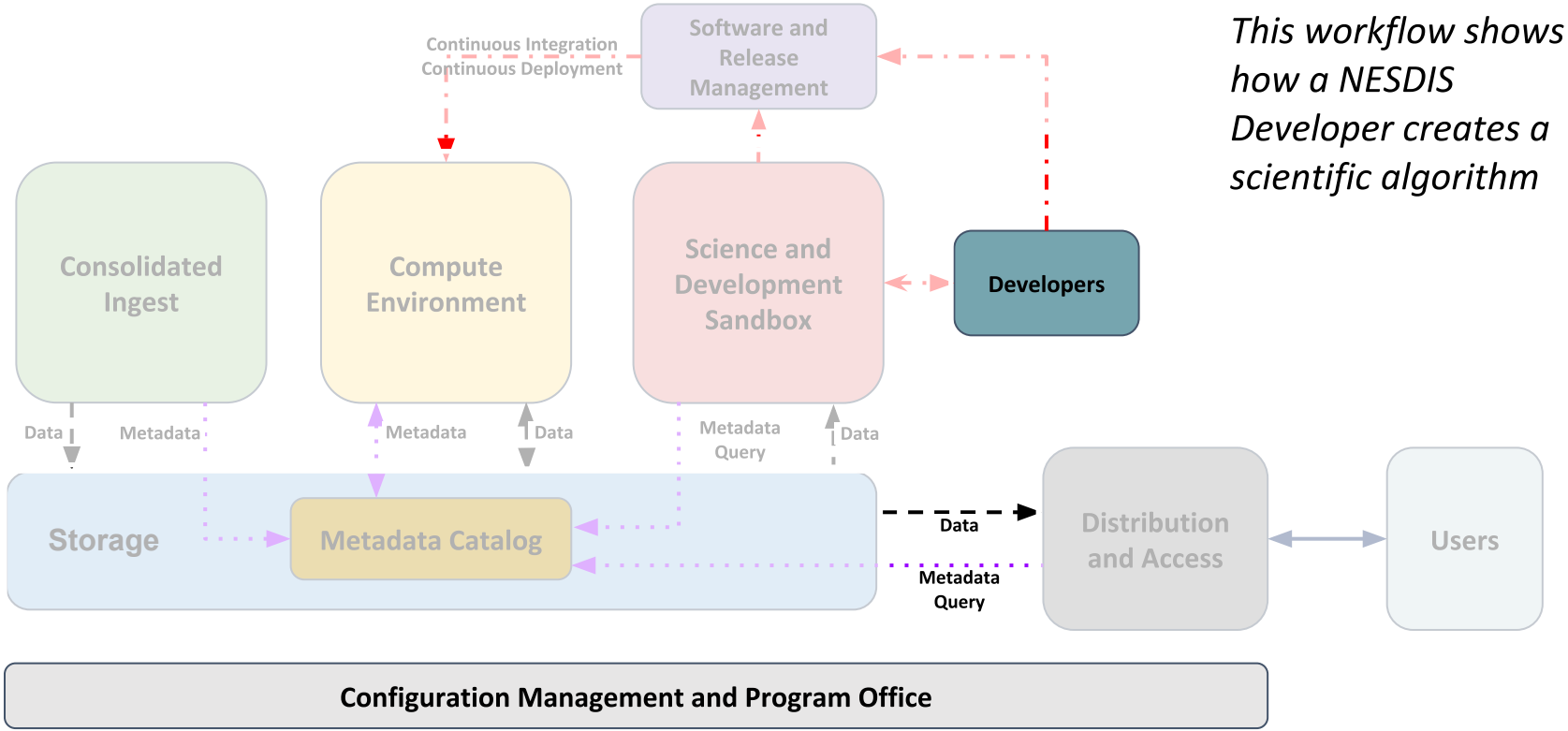
This represents the implementation of the framework for the ingest function using Consolidated Ingest, Storage, *the* Compute Environment, *and* Distribution and Access

Cloud Framework Use Case – Satellite Data Workflow



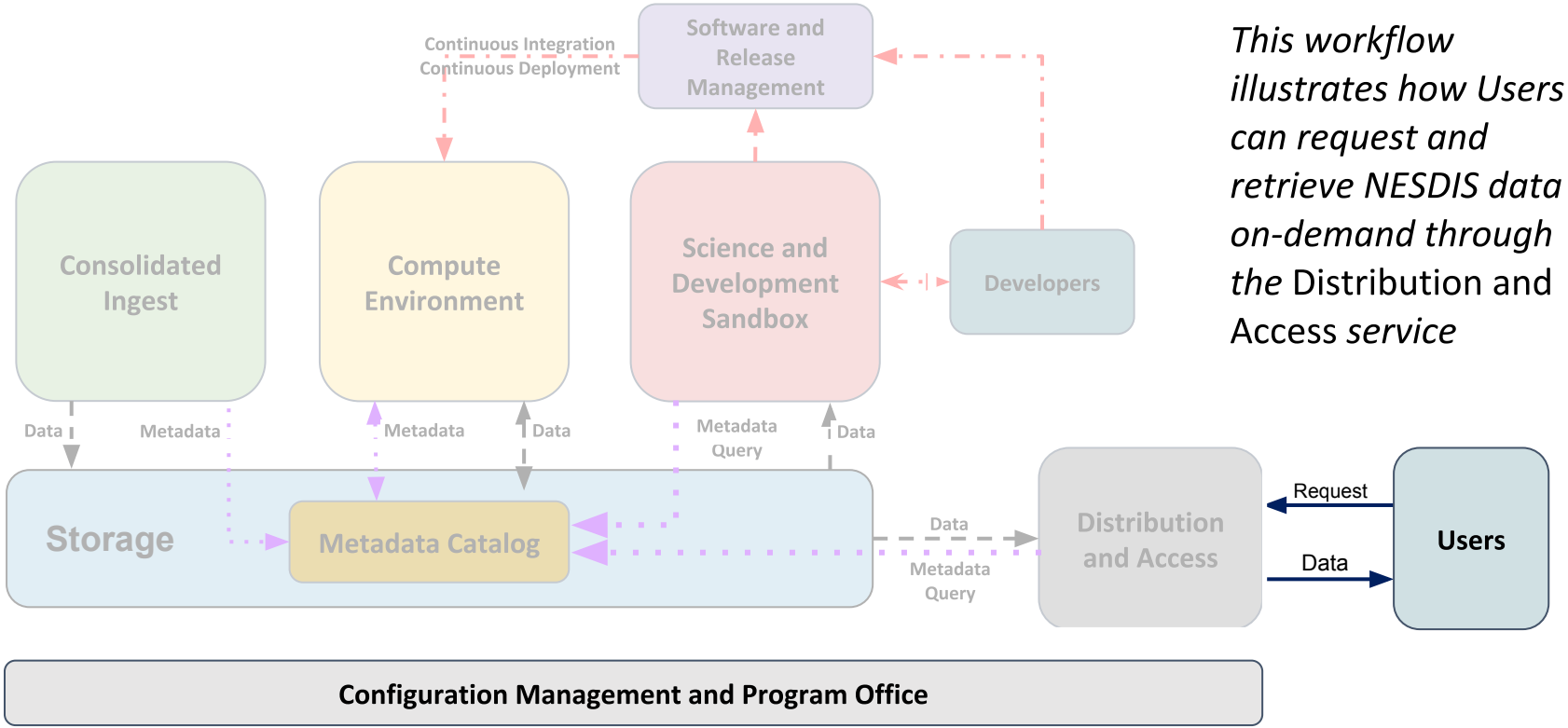
This represents a nominal workflow of operational ingest, processing, and distribution of low-latency satellite data

Cloud Framework Use Case – Science Development Workflow



This workflow shows how a NESDIS Developer creates a scientific algorithm

Cloud Framework Use Case – Data Access & Retrieval



This workflow illustrates how Users can request and retrieve NESDIS data on-demand through the Distribution and Access *service*

Future Innovations & Studies

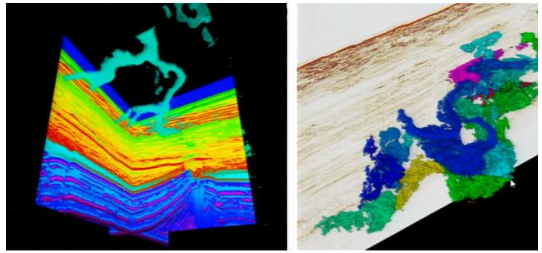
Cloud Native Data Format

Objective: Explore Zarr as the cloud-native data format to facilitate improved science data usability.

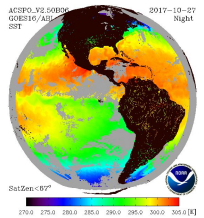
Automation

Objective: Implement an enterprise automated Continuous Integration (CI) and Continuous Deployment (CD) pipeline.

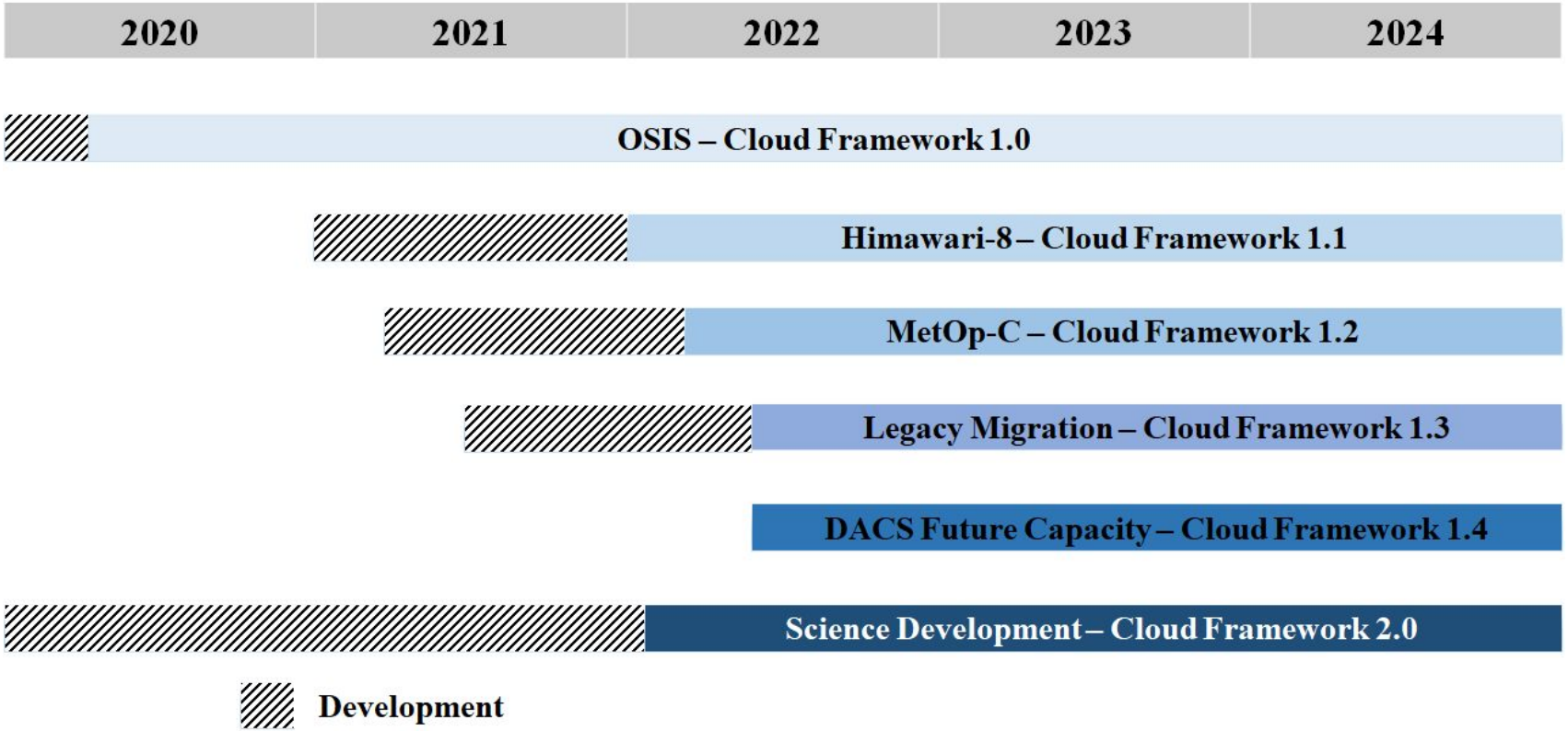
Data Visualization



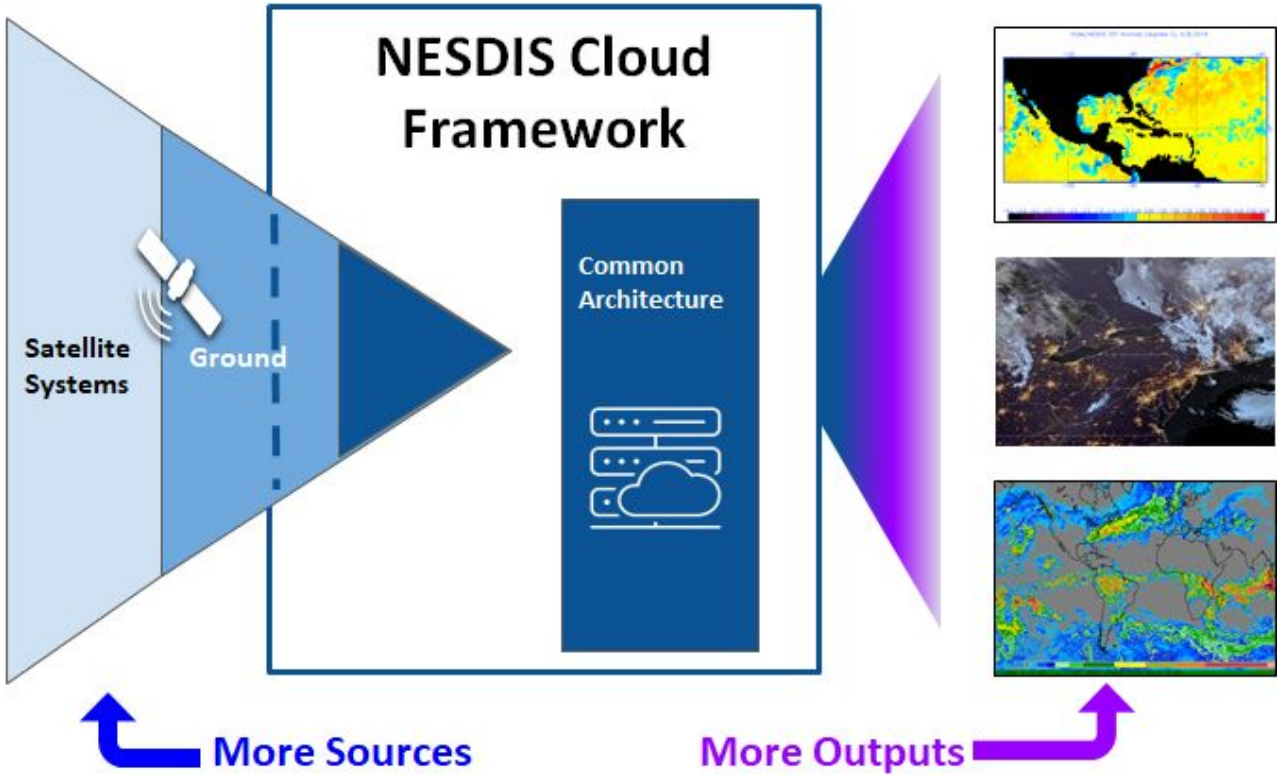
Objective: Evaluate the performance of data visualization tools.



NESDIS Cloud Framework Notional Roadmap



Looking Toward a NESDIS Cloud Future



Q&A

Contact NESDIS.Cloud@noaa.gov

BACKUP SLIDES

Science Algorithm Evaluation Summary

Program	Algorithm	LOE to Prepare for HPC Framework	LOE NESDIS Cloud Framework Integration	Science Quality Met?	Latency Req. Met?
LEO	**CloudMask** **MiRS** **ATMS SDR** Requirement: 15 Minutes **Derived Motion Winds** **SST** **VIIRS SDR**	2-3 Weeks	72 Staff Hours	✓	✓
GEO	**CloudMask -** Requirement: CONUS - 5 Min, Full Disk - 15 Min, Mesoscale - 5 Min **Derived Motion Winds** - Requirement: CONUS - 15 Min, Full Disk - 60 Min, Mesoscale - 5 Minutes **AHI ACSPO SST** - Requirement: 10 Minutes **AHI Rainfall Rate** - Requirement: 10 Minutes	2-3 Weeks	72 Staff Hours	✓	✓
NCEI	**Gridded 5km Daily Temp/Precip Dataset** - Requirement: 24 Hours **Global Historical Climatology Network** - Requirement: Monthly **Space Weather** - Requirement: 30 Seconds	2-3 Weeks	TBD	TBD	TBD